Attorney Docket No. 13DV-13810 (07783-0090)

B.) AMENDMENTS TO THE SPECIFICATION

Please replace Paragraph [0001] with the following Paragraph [0001]:

[0001] The present invention relates to thermal barrier coatings for components exposed to high temperatures, such as the hostile thermal environment of a gas turbine engine. More particularly, this invention is directed to thermal barrier coatings comprising ~~the~~ mischmetal oxide.

Please replace Paragraph [0010] with the following Paragraph [0010]:

[0010] As is known in the art, most rare earth oxides are found in one type of ore, commonly known as mischmetal ore, which, once mined, is cleaned and then smelted to a mixture of rare-earth metals, such as cerium (Ce), lanthanum (La), praseodymium ~~praesodymium~~ (Pr), and neodymium (Nd), and impurities. This mixture of metals is commonly known as "mischmetal." As used herein the term "mischmetal" refers to clean mischmetal ore as known in the art. As used herein the term "mischmetal oxide" means oxidized clean mischmetal ore as known in the art that is obtained by oxidizing clean mischmetal. The specific combination of rare earth metals in the mischmetal ore varies depending on the mine and vein from which the ore was extracted. Mischmetal generally has a composition, based on 100% of weight, of about 30% to about 70% Ce by weight, about 19% to about 56% La by weight, about 2% to about 7% Pr by weight and from about 0% to about 20% Nd by weight, and impurities. Mischmetal is often refined to its individual rare-earth metals constituents. The present invention uses mischmetal, which has not been separated and refined into its individual metal constituents, as a source of oxides for

the deposition of TBC by EB-PVD, such that the TBC comprises the rare earth oxides present in mischmetal.

Please replace Paragraph [0018] with the following Paragraph [0018]:

[0018] An advantage of the present invention is that the use of the rare earth oxides in the mischmetal oxide, which have lower thermal conductivity than yttria-stabilized zirconia, reduces the conductivity of the TBC, allowing a thinner TBC layer to be applied to the turbine engine component.

Please replace Paragraph [0031] with the following Paragraph [0031]:

[0031] Referring now to FIG. 1 there is shown the method of the present invention for applying ~~of applying~~ a mischmetal oxide TBC to a superalloy turbine engine component of the present invention. The initial step 100 of the process comprises providing an EB-PVD apparatus, a superalloy turbine engine component comprising a surface to be coated, a first mischmetal ingot, and a second oxide ingot comprising another oxide material selected from the group consisting of yttria-stablized zirconia, zirconia, yttria, hafnia, at least one other rare earth oxide, and combinations thereof. The mischmetal ingot preferably comprises, based on 100% of weight, about 30% to about 70% Ce by weight, about 19% to about 56% La by weight, about 2% to about 7% Pr by weight and from about 0% to about 20% Nd by weight. The preferred mischmetal ingot may also contain impurities, such as iron and/or silicon. In a more preferred embodiment, the mischmetal ingot comprises, based on 100% of weight, about 30% to about 70% Ce by weight, about 19% to about 40% La by weight, about 2% to about 7% Pr by weight, about 0% to about 20% Nd by weight, and balance impurities. Ingots for EB-PVD processes are well known in the art. Such superalloy components may comprise nickel-based, iron-

based, or cobalt-based superalloys as known in the art. The EB-PVD apparatus may be any such apparatus as known in the art. For example, the EB-PVD apparatus disclosed in U.S. Patent No. 6,589,351 B1 can be used for the present invention. U.S. Patent No. 6,589,351 B1, which is assigned to the assignee of the present invention, is incorporated by reference herein. The turbine engine component may be partially masked with an appropriate maskant to protect preselected surfaces from being coated as known in the art.

Please replace Paragraph [0034] with the following Paragraph [0034]:

[0034] The next step 210 of the process is placing the component and the ingots into the apparatus as known in the art and drawing a vacuum within the apparatus ~~appartus~~. The next step 220 of the process is forming melt pools on the ingots and dispersing mischmetal oxide vapors and other oxide vapors. The next step 230 of the process is co-depositing the mischmetal oxide vapors and the other oxide vapors onto the surface to be coated, the co-deposition forming a thermal barrier coating having a thickness in the range of about 0.0025 inch to about 0.010 inch. In an optional embodiment, the co-deposition may be intermittent, where the electron beam is only directed at one ingot at a time. With intermittent co-deposition, the TBC may comprise a plurality of layers, wherein at least one layer comprises mischmetal oxide and at least one layer comprises the other oxide. In a preferred embodiment, the other oxide is 4% - 8% YSZ. In a more preferred embodiment, the other oxide is 7% YSZ, with the TBC comprising, based on 100% of weight, up to about 20% ceria by weight, up to about 30% lanthanum oxide by weight, up to about 7% praseodymium oxide by weight, up to about 20 percent neodymium oxide by weight, and balance [[7%]] YSZ. The TBC may also contain impurities. A weight percentage of ceria in the TBC above about 20 percent reduces the erosion resistance of the TBC.[[.]] The final step 240 of the process is removing the coated component from the apparatus.

Attorney Docket No. 13DV-13810 (07783-0090)

Please replace Paragraph [0038] with the following Paragraph [0038]:

[0038] The next step 420 of the process is placing the component and the ingot into the apparatus as known in the art. The next step 430 of the process is forming a melt pool on the ingot including both the mischmetal oxide and other oxide, and dispersing mischmetal oxide vapors and other oxide vapors. The next step 440 of the process is co-depositing the mischmetal oxide vapors and the other oxide vapors onto the surface to be coated, said co-deposition forming a thermal barrier coating having a thickness in the range of about 0.0025 inch to about 0.010 inch. In a preferred embodiment, the other oxide is 4% - 8% YSZ. In a more preferred embodiment, the yttria-stabilized zirconia is 7% YSZ, with the TBC comprising, based on 100% of weight, up to about 20% ceria by weight, up to about 30% lanthanum oxide by weight, up to about 7% praseodymium oxide by weight, up to about 20 percent neodymium oxide by weight, and balance [[7%]] YSZ. The TBC may also contain impurities. The final step 450 of the process is removing the coated component from the apparatus.